

[Table 1] X-ray diffraction pattern of mordenite

Lattice spacing	d(Å)	Intensity
13.6	± 0.2	M
10.2	± 0.2	W
9.0	± 0.2	S
6.56	± 0.1	S
6.40	± 0.1	M
6.05	± 0.1	W
5.80	± 0.1	M
4.52	± 0.08	M
3.99	± 0.08	S
3.83	± 0.08	W
3.76	± 0.08	W
3.53	± 0.05	W
3.46	± 0.05	VS
3.38	± 0.05	S
3.28	± 0.05	W
3.20	± 0.05	S
3.15	± 0.05	W
2.89	± 0.05	M
2.51	± 0.05	W

[Table 2] X-ray diffraction pattern of pentasil-type zeolite

Lattice spacing	d(Å)	Intensity
11.2	± 0.2	VS
10.1	± 0.2	S
9.8	± 0.2	M
6.37	± 0.1	W
6.00	± 0.1	W
5.71	± 0.1	W
5.58	± 0.1	W
4.37	± 0.08	W
4.27	± 0.08	W
3.86	± 0.08	VS
3.82	± 0.08	VS
3.75	± 0.08	S
3.72	± 0.08	S
3.66	± 0.05	M
3.00	± 0.05	M
2.00	± 0.05	W

[Table 3] Evaluation of catalytic performance (CT isomerization reaction)

Catalyst	A (Example 2)	B (Comparative Example 1)
Reaction conditions		
Reaction temperature °C	260	260
Reaction pressure MPa-G	3.4	3.4
WHSV Hr ⁻¹	1.5	1.5
Reaction time Hrs	202	206
Supplied raw material		
o-CT/benzene wt/wt	2/1	2/1
o-CT isomerization rate wt%	51.2	45.6
CT isomer ratio wt%		
o-CT/CT	48.8	54.4
m-CT/CT	37.6	33.1
p-CT/CT	13.6	12.5

[Table 4] Evaluation of catalytic performance (DCB isomerization reaction)

Catalyst	A (Example 2)	B (Comparative Example 1)
Reaction conditions		
Reaction temperature °C	350	350
Reaction pressure MPa-G	2.9	2.9
WHSV Hr ⁻¹	4.0	4.0
Reaction time Hrs	24	24
o-DCB conversion percentage wt%	68.2	57.9
Reaction product wt%		
CB	0.01	0.02
o-DCB	31.77	42.13
m-DCB	46.50	41.43
p-DCB	21.72	16.42
ΣDCB	99.99	99.98

Note: CB = Chlorobenzene

[Table 7] Evaluation of catalytic performance (DCT isomerization reaction)

Catalyst	Supplied raw material	C (Example 10)	D (Example 10)	E (Example 11)	F (Example 11)	G (Example 12)	H (Example 13)	I (Comparative Example 3)
Reaction conditions								
Reaction temperature $^{\circ}\text{C}$		320	320	320	320	335	330	345
Reaction pressure MPa-G		8.9	8.9	8.9	8.9	8.9	8.9	8.9
H/DCT mole/mole		0.06	0.06	0.06	0.06	0.06	0.06	0.06
WHSV Hr $^{-1}$		2.0	2.0	2.0	2.0	2.0	2.0	2.0
Reaction time Hrs		140	144	136	150	146	140	150
Reaction product wt%								
Benzene, toluene, xylylene		0.21	0.19	0.18	0.18	0.22	0.21	0.23
Chlorobenzene		0.49	0.52	0.50	0.45	0.56	0.54	0.64
Chlorotoluene		1.01	0.80	0.77	0.90	0.82	0.77	1.04
Dichlorobenzene		1.14	1.08	1.04	0.96	1.24	1.21	1.31
Dichloroethylene		1.13	2.46	2.42	2.40	2.32	2.63	2.59
Σ GEB		98.87	94.69	94.99	95.11	95.19	94.53	93.71
DCT isomer ratio wt%								
2, 5-DCT/DCT		45.03	39.07	38.60	38.72	38.19	38.90	38.32
2, 6-DCT/DCT		0.88	6.33	6.78	6.64	7.00	6.39	6.71
3, 5-DCT/DCT		11.26	12.59	12.70	12.63	12.65	12.68	12.56
2, 4-DCT/DCT		34.35	31.75	31.51	31.58	31.43	31.66	31.63
3, 4-DCT/DCT		3.84	4.74	4.85	4.86	5.10	4.80	4.98
2, 3-DCT/DCT		4.64	5.52	5.56	5.57	5.63	5.56	5.60

[Table 5]

Reaction temperature °C	324
Reaction pressure MPa-G	3.9
WHSV Hr ⁻¹	0.4

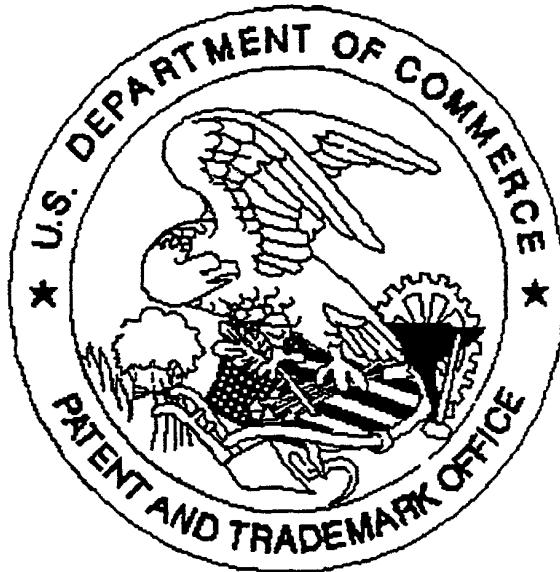
[Table 6]

	Dissolved oxygen content of raw material	Catalyst degradation rate
Example 5	0 ppm	0.33%/day
Comparative Example 2	Approx. 40 ppm	0.63%/day

[Table 8] Evaluation of catalytic performance (CEB isomerization reaction)

Catalyst	Supplied raw material	F (Example 11)
Reaction conditions		
Reaction temperature °C		245
Reaction pressure MPa-G		4.0
H/DCT mole/mole		0.06
WHSV Hr ⁻¹		1.3
Reaction time Hrs		188
Reaction product wt%		
Low boiling point compounds		0.02
Benzene		0.10
Ethylbenzene	0.21	0.38
Chlorobenzene	0.06	0.61
ΣCEB	99.73	95.79
High boiling point products		2.10
CEB isomer ratio wt%		
o-CEB/CEB	53.13	31.96
m-CEB/CEB	8.70	48.12
p-CEB/CEB	38.17	19.92
CEB recovery rate wt%		96.05

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